REMARKS

Claims 1-4, 6, 7, 11-16 and 49-53 are pending. With the cancellation of claim 2, 5, 8-10, 17-48 and 54-63, and the addition of claim 64, claims 1, 3, 4, 6, 7, 11-16, 49-53 and 64 will be pending. Claims 49-53 were added previously. Claim 2 is canceled in this response and claim 64 is added in this response. Claims 5, 8-10 and 17-48 and 54-63 were canceled.

Claims 1-4, 6, 7 and 11-16 have been amended, wherein new amendments to claims 11-13, 15 and 16 are made in this response to the Office Action.

STATUS OF CLAIMS AND SUPPORT FOR CLAIM CHANGES

1. (Pending) The current amendment to claim 1 is supported, for example, by Examples 4 and 5 and Figure 3 of the specification. Five embodiments of the current invention are disclosed as recombinant gene constructs in Example 4 and demonstrated to synthesize farnesyl diphosphate having a shorter chain length than the native gene in Example 5 and Figure 3 of the specification. Col. 12, line 1 through Col. 14, line 16. The deletion of the comma after "amino acid sequence" is editorial and is performed in order to show the claim amendment as relative to claim 1 in the patent as required by MPEP 1453(IV).

2. (Canceled)

3. (Pending) The amendment to claim 3 is editorial and supported by the patent claim 3.

4. (Pending) The amendment to claim 4 is editorial and supported by the patent claim 4.

5. (Canceled)

6. (Pending) The current amendment to claim 6 is editorial, supported by the specification at column 6, lines 22-34 and performed as suggested by the Examiner.

7. (Pending) The current amendment is supported by Example 5 and Figure 2.

8-10. (Canceled)

11. (Pending) The current amendment to claim 11 is editorial by replacing "an enzyme" with "the mutant prenyl diphosphate synthase."

12. (Pending) The current amendment to claim 12 is editorial by replacing "a" with "the."

13. (Pending) The current amendment to claim 13 is editorial by replacing "a" with "the."

14. (Pending) The amendment to claim 14 is editorial.

15. (Pending) The current amendment is editorial by replacing "coding for" with "encoding" and "expression product" with "mutant prenyl diphosphate synthase according to claim 1." The insertion "wherein the mutant prenyl diphosphate synthase is produced by expression of the expression vector" is made as requested by the Examiner to show the relationship between the expression vector and the expression product. The descriptive support for the insertion is found in column 7, lines 28-32, of the patent.

16. (Pending) The current amendment to claim 16 is editorial by replacing "an enzyme" with "the mutant prenyl diphosphate synthase."

17-48. (Canceled)

49. (Pending) Claim 49, a claim not found in the patent, is amended from claim 49 presented in the Response to Office Action filed June 29, 2007 by replacing "is modified by" with "is modified by only". Claim 49 presented in the Response filed on June 29, 2007 differs from claim 49 presented in the Response filed December 22, 2006 in that the claim recitations are recited in active voice instead of passive voice. The recitation "wherein said amino acid sequence modifications consist of threonine modified to phenylalanine at position 78 and histidine modified to alanine at position 81" is replaced with ", wherein the amino acid sequence of SEQ ID NO:1 is modified by replacing threonine with phenylalanine at position 78 and replacing histidine with alanine at position 81". Support may be found, for example, in the substitution-mutated pBs-SacGGPS plasmid containing SEQ ID NO:9 disclosed in Example 4 and the functional enzyme expressed from the plasmid as disclosed in Example 5 and Figure 3.

50. (Pending) Claim 50, a claim not found in the patent, is amended from claim 50 presented in the Response to Office Action filed June 29, 2007 by replacing "is modified by" with "is modified by only". Claim 50 presented in the Response filed on June 29, 2007 differs from claim 50 presented in the Response filed December 22, 2006 in that the claim recitations are recited in active voice instead of passive voice. The recitation "wherein said amino acid

sequence modifications consist of threonine modified to phenylalanine at position 78 and histidine modified to leucine at position 81" is replaced with ", wherein the amino acid sequence of SEQ ID NO:1 is modified by replacing threonine with phenylalanine at position 78 and replacing histidine with leucine at position 81". Support may be found, for example, in the substitution-mutated pBs-SacGGPS plasmid containing SEQ ID NO:10 disclosed in Example 4 and the functional enzyme expressed from the plasmid as disclosed in Example 5 and Figure 3.

51. (Pending) Claim 51, a claim not found in the patent, is amended from claim 51 presented in the Response to Office Action filed June 29, 2007 by replacing "is modified by" with "is modified by only". Claim 51 presented in the Response filed on June 29, 2007 differs from claim 51 presented in the Response filed December 22, 2006 in that the claim recitations are recited in active voice instead of passive voice. The recitation "wherein said amino acid sequence modifications consist of phenylalanine modified to tyrosine at position 77, threonine modified to phenylalanine at position 78 and histidine modified to leucine at position 81" is replaced with ", wherein the amino acid sequence of SEQ ID NO:1 is modified by replacing phenylalanine with tyrosine at position 77, replacing threonine with phenylalanine at position 78 and replacing histidine with leucine at position 81". Support may be found, for example, in the substitution-mutated pBs-SacGGPS plasmid containing SEQ ID NO:11 disclosed in Example 4 and the functional enzyme expressed from the plasmid as disclosed in Example 5 and Figure 3.

52. (Pending) Claim 52, a claim not found in the patent, is amended from claim 52 presented in the Response to Office Action filed June 29, 2007 by replacing "is modified by" with "is modified by only". Claim 52 presented in the Response filed on June 29, 2007 differs from claim 52 presented in the Response filed December 22, 2006 in that the claim recitations are recited in active voice instead of passive voice. The recitation "wherein said amino acid sequence modifications consist of phenylalanine modified to tyrosine at position 77, threonine modified to phenylalanine at position 78 and histidine modified to alanine at position 81" is replaced with ", wherein the amino acid sequence of SEQ ID NO:1 is modified by replacing phenylalanine with tyrosine at position 77, replacing threonine with phenylalanine at position 78 and replacing histidine with alanine at position 81". Support may be found for claim 52, for example, in the substitution-mutated pBs-SacGGPS plasmid containing SEQ ID NO:12

disclosed in Example 4 and the functional enzyme expressed from the plasmid as disclosed in Example 5 and Figure 3.

53. (Pending) Claim 53, a claim not found in the patent, is amended from claim 53 presented in the Response to Office Action filed June 29, 2007 by replacing "is modified by" with "is modified by only". Claim 53 presented in the Response filed on June 29, 2007 differs from claim 53 presented in the Response filed December 22, 2006 in that the claim recitations are recited in active voice instead of passive voice. The recitation "wherein said amino acid sequence modifications consist of phenylalanine modified to tyrosine at position 77, threonine modified to serine at position 78, valine modified to isoleucine at position 80, isoleucine modified to leucine at position 84 and proline and serine inserted sequentially between position 84 and position 85" is replaced with ", wherein the amino acid sequence of SEQ ID NO:1 is modified by replacing phenylalanine with tyrosine at position 77, replacing threonine with serine at position 78, replacing valine with isoleucine at position 80, replacing isoleucine with leucine at position 84 and inserting proline and serine sequentially between position 84 and position 85". Support may be found for claim 53, for example, in the substitution-mutated pBs-SacGGPS plasmid containing SEQ ID NO:13 disclosed in Example 4 and the functional enzyme expressed from the plasmid as disclosed in Example 5 and Figure 3.

Claims 54-63. (Canceled)

Claim 64. (New) Claim 64 is added. Descriptive support for claim 64 can be found in Example 5.

Reissue Oath/Declaration

The reissue oath/declaration filed on July 12, 2001 was objected to as defective for stating "duty to disclose under 37 CFR 1.56(a)" instead of "duty to disclose under 37 CFR 1.56". The defective reissue oath/declaration will be corrected by submitting a substitute reissue oath/declaration when, as suggested by the Office Action referencing MPEP 1444.II, the Examiner indicates that the reissue application is in a condition for allowance.

Claim Objections

Claims 11 and 16 were objected to for the recitation "an enzyme". Applicants have amended claims 11 and 16 by replacing "an enzyme" with "the mutant prenyl diphosphate synthase" .

Claim 15 was objected to because of "coding for". Applicants have amended claim 15 by replacing "coding for" with "encoding".

Claims 49-53 were objected to as omitting a claim status identifier, i.e., "(New)". Applicants respectfully traverse the objection. The attention of the Examiner is directed to 37 CFR 1.173(a)(2) and MPEP 1453 IV C which do not require the claim status identifier for claims added to a patent in reissue.

Withdrawal of the objections is requested.

Rejection of Claims — Indefiniteness

Claims 15 and 16 were rejected as allegedly indefinite due to the recitation "the expression product". Applicants have replaced "the expression product" with "the mutant prenyl diphosphate synthase according to claim 1" in claim 15. Withdrawal of the rejections is requested because applicants submit that one skilled in the art would understand the meaning of the recitation.

Rejection of Claims —Written Description

Applicants respectfully traverse the rejections of claims 2, 7 and 16 as not meeting the written description requirement of 35 U.S.C. 112, first paragraph. The Examiner took a position that the description in Example 5 does not fully support the amendment to claim 2 made in the response filed on October 30, 2007. Although in disagreement, applicants have deleted the recitation on the synthesis of farnesyl diphosphate from claim 2. Applicants have also amended claim 7 by adding the conditions used in Example 5. Applicants submit that claims 2, 7 and 16 contain no new matter.

Applicants respectfully traverse the new matter rejections of claims 12-14 because of the recitation "a DNA according to claim 11". To advance prosecution, applicants have amended claims 12 and 13 by replacing "a DNA according to claim 11" with "the DNA according to

claim 11". Since the five mutant prenyl diphosphate synthases are fully described in the patent, applicants submit that claims 12-14 contain no new matter.

Withdrawal of the written description rejections is requested.

Claim Rejections -- Enablement

Applicants respectfully traverse the rejections of claims 12-14 as not enabled by the specification other than the Mutant enzymes 1-5 recited in claim 1. With the amendment to claims12 and 13 by replacing "a DNA according to claim 11" with "the DNA according to claim 11", applicants submit that claims 12-14 are enabled because claims 1 and 11 are enabled. Withdrawal of the non-enablement rejections is requested.

CONCLUSION

At least in view of the above reasoning, the claims are believed to be in condition for allowance. The Examiner is invited to contact the undersigned to discuss any issues related to this application.

In the event that the filing of this paper is deemed not timely, applicants petition for an appropriate extension of time. The Office is authorized to charge any fees, including the extension fee, or credit any overpayment regarding this application to Kenyon & Kenyon LLP **Deposit Account No. 11-0600**.

Respectfully submitted,

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King L. Wong

King L. Wong
Registration No. 37,500

KENYON & KENYON LLP
1500 K Street, N.W., Suite 700
Washington, DC 20005
Tel: (202) 220-4200
Fax: (202) 220-4201